

CLAIMS

1. A method for displaying an image in an electronic medium, comprising:
changing a first set of dimension values associated with an image being displayed,
wherein the image being displayed remains undisturbed when changing the first set of
5 dimension values;
changing a second set of dimension values associated with a display region in
which the image is being displayed, wherein the display region remains undisturbed when
changing the second set of dimension values;
providing a completion signal indicating completion of changing the first set of
10 dimension values and the second set of dimension values;
receiving a trigger signal indicating a beginning of a new image to be displayed;
and
implementing the changed first set of dimension values and the changed second
set of dimension values upon receiving the trigger signal while the completion signal is
15 being provided.

2. A method for displaying an image in an electronic medium as recited in
claim 1, wherein changing the first set of dimension values and the second set of
dimension values spans a number of trigger signal receptions while the completion signal
20 has not yet been provided.

3. A method for displaying an image in an electronic medium as recited in
claim 1, further comprising:
operating image synchronization logic to recognize receipt of the trigger signal
25 while the completion signal is being provided; and

operating the image synchronization logic to cause an essentially simultaneous implementation of the changed first set of dimension values and the changed second set of dimension values.

5 4. A method for displaying an image in an electronic medium as recited in claim 1, wherein the first set of dimension values are stored in four registers associated with camera image resizer logic and the second set of dimension values are stored in four registers associated with a picture-in-picture (PIP) window.

10 5. A method for displaying an image in an electronic medium as recited in claim 4, wherein providing the completion signal is performed by setting an enable bit within a last register changed, wherein the last register changed represents a final register required to have its dimension value changed.

15 6. A method for displaying an image in an electronic medium as recited in claim 4, wherein changing the first set of dimension values stored in the four registers associated with camera image resizer logic is performed by duplicating changes made to the second set of dimension values stored in the four registers associated with the PIP window.

20 7. A method for displaying an image in an electronic medium as recited in claim 1, wherein the image is a camera image and the trigger signal is a VSYNC signal indicating a new frame of the camera image.

25 8. A method for displaying a live camera image in a picture-in-picture (PIP) window, comprising:

receiving an input to change a size of the PIP window;
changing a value stored in a PIP window dimension register;
changing a value stored in a camera image dimension register;
setting an enable bit to indicate a completion of changing the values stored in the
5 PIP window dimension register and the camera image dimension register;
receiving a new frame signal associated with the camera image; and
implementing the values stored in the PIP window dimension register and the
camera image dimension register upon receiving the new frame signal, wherein
implementing the values is enabled by the enable bit being set to indicate a completion of
10 changing the values stored in the PIP window dimension register and the camera image
dimension register.

9. A method for displaying a live camera image in a PIP window as recited in
claim 8, further comprising:

15 delaying implementation of the changed values stored in the PIP window
dimension register and the camera image dimension register until the new frame signal is
received while the enable bit is set to indicate a completion of changing the values.

10. A method for displaying a live camera image in a PIP window as recited in
20 claim 8, wherein changing the values stored in the PIP window dimension register and
the camera image dimension register spans a number of new frame signals while the
enable bit has not yet been set.

11. A method for displaying a live camera image in a PIP window as recited in
25 claim 8, wherein the new frame signal associated with the camera image is a VSYNC
signal.

12. A method for displaying a live camera image in a PIP window as recited in claim 8, wherein each PIP window dimension register and each camera image dimension register includes the enable bit, the enable bit being set in a last dimension register to be
5 changed upon completion of the change in the last dimension register.

13. A method for implementing dimension register updates corresponding to a displayed camera image and associated display region, comprising:

receiving a signal indicating a beginning of a new camera image frame;

10 examining enable bits associated with dimension registers defining a size of the displayed camera image and a size of a display region in which the camera image is displayed, wherein the enable bits provide a status indication of dimension register change completion; and

implementing values stored in the dimension registers when any enable bit
15 indicates a completed status.

14. A method for implementing dimension register updates corresponding to a displayed camera image and associated display region as recited in claim 13, further comprising:

20 maintaining implementation of previous values stored in the dimension registers when receiving the signal indicating the beginning of the new camera image frame when each enable bit indicates an incomplete status of the dimension register changes.

15. A display controller for use in an electronic device having an image
25 display capability, comprising:

a first set of dimension registers configured to store dimension values for resizing an image to be displayed, each of the first set of dimension registers including an enable bit;

5 a second set of dimension registers configured to store dimension values for defining a display region in which the image to be displayed, each of the second set of dimension registers including an enable bit; and

image synchronization circuitry configured to recognize an asserted enable bit setting in any dimension register of the first set of dimension registers and the second set of dimension registers, the image synchronization circuitry being further configured to
10 implement dimension values stored in each of the first set of dimension registers and the second set of dimension registers upon both recognizing the asserted enable bit setting and receiving a trigger signal indicating a beginning of a new image to be displayed.

16. A display controller for use in an electronic device having an image
15 display capability as recited in claim 15, wherein the image synchronization circuitry is configured to recognize a vertical synchronization signal as the trigger signal, the vertical synchronization signal to be provided in conjunction with image data to be received by the display controller.

20 17. A display controller for use in an electronic device having an image display capability as recited in claim 15, wherein the image synchronization circuitry is configured to implement the dimension values stored in each of the first set of dimension registers and the second set of dimension registers in a simultaneous manner.

25 18. A display controller for use in an electronic device having an image display capability as recited in claim 15, further comprising:

camera interface circuitry configured to receive data defining the image to be displayed; and

resizer circuitry configured to adjust a size of the image to be displayed in accordance with dimension values stored in the first set of dimension registers, the resizer
5 circuitry further configured to be controlled by the image synchronization circuitry.

19. A display controller for use in an electronic device having an image display capability as recited in claim 15, wherein the display controller is incorporated into a portable electronic computing device.

10

20. A display controller for use in an electronic device having an image display capability as recited in claim 19, wherein the portable electronic computing device is selected from the group consisting of a cellular phone, a personal digital assistant, a web tablet, and a pocket personal computer.

15